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(58) **Field of Classification Search**

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See application file for complete search history.

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(56)

References Cited

U.S. PATENT DOCUMENTS

2,149,518 A 3/1939 Frank, Sr.
3,470,324 A 9/1969 Harmuth

(Continued)

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FOREIGN PATENT DOCUMENTS

CN 1166094 11/1997
CN 1255792 A 6/2000

(Continued)

OTHER PUBLICATIONS

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3GTS 25.211 "Physical channels and mapping of transport channels
onto physical channels (FDD)", Release 5, V5.0.0, Mar. 2002.

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(57)

ABSTRACT

Techniques for efficient signaling to and from a plurality of
mobile stations are disclosed. In one embodiment, a subset of
mobile stations may be allocated a portion of the shared
resource with one or more individual access grants, another
subset may be allocated a portion of the shared resource with
a single common grant, and yet another subset may be
allowed to use a portion of the shared resource without any
grant. In another embodiment, an acknowledge and continue
command is used to extend all or a subset of the previous
grants without the need for additional requests and grants, and
their associated overhead. In one embodiment, a traffic to
pilot ratio (T/P) is used to allocate a portion of the shared
resource, allowing a mobile station flexibility in selecting its
transmission format based on T/P.

21 Claims, 17 Drawing Sheets

